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Will "Streamlining" the Mortgage Foreclosure Process Reduce Vacancy and Abandonment?

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Abstract

In recent years, many communities around the U.S. have experienced large increases in residential mortgage foreclosures. These foreclosures have been disproportionately concentrated in older urban communities, central cities, and neighborhoods with large minority populations. Especially when occurring in modest-income neighborhoods, foreclosures can have debilitating effects on urban stability and revitalization, particularly when they lead to significant episodes of vacancy, abandonment or blight. Local planners and community organizations are struggling to find ways both to both reduce the incidence of foreclosures and to lessen the harm that foreclosures can cause to neighborhoods and larger communities.

Some have suggested that speeding up the foreclosure process could help reduce the propensity of foreclosed properties to become vacant, abandoned and blighted, thus reducing the significant negative externalities of foreclosures. Alternatively, however, a more rapid foreclosure process might increase transitions from foreclosure to vacancy because homeowners have less time to seek out alternatives to foreclosure, including selling the home or seeking some sort of loan modification or temporary forbearance. To evaluate the potential wisdom of modifying foreclosure processes and timeframes, better information is needed on the potential benefits or costs of doing so, including any impacts on neighborhoods.

This study compares the effect of foreclosures on changes in housing vacancy in two inner metropolitan areas with very different foreclosure procedures and timelines – Cook County, Illinois (Chicago area) and the five-county Atlanta area. In Cook County, foreclosures are governed by Illinois foreclosure law, which follows a judicial foreclosure process that can take up to a year to complete from filing the foreclosure notice to foreclosure sale. Georgia, on the other hand, is a nonjudicial foreclosure state well known for its rapid foreclosure process, which can take less than two months. The objective is to determine whether the speed of the foreclosure process appears to reduce the propensity of foreclosures to lead to increased vacant or abandoned property. The analysis utilizes foreclosure filing data in two core metropolitan areas. Also employed are data from the 1990 and 2000 census on vacant housing units, neighborhood demographics, housing stock characteristics, and related changes in these variables.

The first finding is that increased foreclosure rates consistently result in increased off-market vacancies at the neighborhood level. However, with respect to the key question of whether the foreclosure law regime appears to affect the propensity of foreclosures to lead to off-market vacancies, the results are somewhat ambiguous. Two different econometric techniques are used. The results from one suggests that foreclosures have a slightly larger impact on off-market vacancy in Cook County than in the Atlanta area. This might be viewed as supporting the notion that, in states with longer foreclosure periods, foreclosures are more likely to lead to vacant houses. The difference in terms of actual impact on vacancy rates is not very large however. Moreover, using the other econometric technique – which is better suited to the skewed distribution of the vacancy data – results in a coefficient for the Atlanta data that is substantially larger than the coefficient for the Cook County data, suggesting that foreclosures in Atlanta have a substantially larger impact off-market vacancy compared to those in Cook County. However, the Atlanta results are not statistically significant, which is likely due to the substantially smaller number of census tract observations in the Atlanta data.

Introduction

Over the last decade, many communities around the U.S. have experienced large increases in residential mortgage foreclosures (Apgar and Duda, 2005). These foreclosures have typically been heavily concentrated in older urban communities, central cities, and neighborhoods with high proportions of minority residents. Foreclosures, especially when concentrated in modest-income neighborhoods, can have debilitating effects on urban stability and revitalization, particularly when they lead to significant episodes of vacancy, abandonment or blight (Apgar and Duda, 2005; Immergluck and Smith, 2006a).

Planners and state and local governments have long been concerned about the negative externalities and costs associated with vacant and abandoned residential properties (Greenstein and Sungu-Eryilmaz, 2004; Mallach, 2006). More recently, with the increase in the number of foreclosures, planners and policy makers are looking to address the foreclosure problem in order to prevent the *generation* of vacant properties. Many localities are struggling to find ways both to both reduce the incidence of foreclosures and to lessen the harm that foreclosures can have on neighborhoods and larger communities. The latter involves efforts to revitalize vacant and abandoned properties that have progressed from foreclosure to abandonment as well as initiatives aimed at preventing foreclosed properties from becoming vacant and abandoned.

One aspect of the foreclosure process that may be related to the generation of vacant and abandoned residential buildings is the length of time involved in the foreclosure process. Extended foreclosure periods or complex foreclosure processes might lead to prolonged periods of vacancy which allow for more chances of vandalism and the property falling into

disrepair. Moreover, very high foreclosure costs might increase the instances in which lenders "walk away" from properties that are of marginal value, which in turn can lead to vacancy and abandonment. After detailing some of the public and social costs of foreclosures in Chicago – especially those that end up in abandonment – Apgar and Duda (2005) have argued for "streamlining" Illinois' foreclosure procedures to ensure a "speedy and predictable process once failure is inevitable."

At the same time, in places with rapid, nonjudicial foreclosure processes, advocates for homeowners frequently complain that mortgagor rights are not adequately protected.[2] Moreover, longer foreclosure periods and more borrower protections may make it easier for borrowers to prevent foreclosure either by selling their homes, obtaining the cash necessary to cure their default, or pursuing a variety of foreclosure alternatives.

This study compares the relationship between foreclosure levels and residential vacancy rates in two large central metropolitan areas with very different foreclosure processes – Cook County, Illinois and the five core counties of the Atlanta metropolitan area. Cook County, which includes Chicago, is governed by Illinois foreclosure law, which follows a judicial process in which completing a foreclosure can take up to a year or more. Georgia, on the other hand, is a nonjudicial foreclosure state well known for its very rapid foreclosure process, estimated at well under two months. The objective of this paper is to determine whether the speed of the foreclosure process reduces the propensity of foreclosures to lead to increased vacant or abandoned property.

[2] See, for example, comments by the National Consumer Law Center asking the Federal Reserve to require lenders to choose judicial foreclosure in the case of high-cost loans (Renuart, 2000). (Even in nonjudicial states, lenders have the opportunity to choose judicial foreclosure, but in practicality this is rarely done.) Also see Teegardin, Hardie and Judd (2005) for a journalistic critique of the rapid, nonjudicial foreclosure process in Georgia

The Foreclosure Problem

Data on foreclosures of single-family properties come from a variety of sources. The Mortgage Bankers Association conducts a regular survey of financial institutions which tracks both flows and stocks of foreclosures at various stages. These data are generally not broken out at a geographic level below that of states however. Most other sources of foreclosure data -including most that permit geographic identification below the state level—derive from notices of foreclosures that are published, per state regulations, in local general or specialized newspapers or similar vehicles. In some areas—especially larger metropolitan areas and some states—private firms collect foreclosure notice data across counties and compile it electronically, making it more accessible to researchers and analysts.

The Mortgage Bankers Association's delinquency survey data show that, in the last decade, many states have experienced increases in mortgage foreclosures, with particularly large increases occurring during recent economic downturns. Twenty-three states saw increases in foreclosures of more than 24 percent from the end of 2001 to the end of 2003, with eight of these seeing increases of more than 50 percent over the period. States like Indiana, Ohio, Kentucky, South Carolina, Pennsylvania, and Mississippi all had foreclosure rates above 2 percent in late 2003 (Federal Deposit Insurance Corporation, 2004). These rates are quite high compared to historical levels. In the early 1980s, foreclosure rates on conventional loans were on the order of 0.3 to 0.4 percent. They rose significantly over that decade to about 0.8 percent (Elmer and Seelig, 1998). Even as the economy improved in the 1990s, foreclosure rates increased, reaching 1.04 percent by 1997. In the late 1990s and early 2000s, the pattern remained one of historically high foreclosure levels reaching 1.3 percent in late 2003 (Federal Deposit Insurance Corporation, 2004). It is important to note that

statewide rates mask what can be much higher foreclosure rates in many smaller areas, especially modest-income and minority neighborhoods.

One commonly cited national source of foreclosure data for property investors is RealtyTrac, Inc.'s U.S. Metropolitan Foreclosure Market Report.[3] The firm compiles foreclosure totals (for loans entering any stage of the foreclosure process) for what it lists as the 100 largest metropolitan areas. Of these areas, 81 were among the 103 MSAs with more than 500,000 residents in 2000.

To provide a proxy for foreclosure rate for each of these 81 MSAs, I divided the number of first quarter 2006 foreclosures in process from the RealtyTrac report by the number of home purchase loans in the metro area in 2003. Figure 1 plots this figure against the share of home purchase loans made by subprime lenders in 2003, an overall indicator of loan default risk.[4] The dashed and dotted ovals indicate that large metro areas generally lie along two distinct axes running northwest on the chart at different angles. In the MSAs in the dashed oval, foreclosure rate rises quickly as subprime lender share increases. The MSAs in the dotted oval experience a slower rate of increase, even as subprime lender share reaches very high levels.

Figure 1 also shows that metropolitan areas with larger median loan sizes (a proxy for median home values) in 2003 are indicated by solid black dots while those with relatively smaller loan sizes are indicated by gray dots. Most of the metros in the steeper, dashed oval

[3] RealtyTrac, Inc. (2006b) claims to offer "the largest national database of pre-foreclosure, foreclosure, for sale by owner, and new home construction properties, with more than 550,000 properties across the country." It also claims to be rated the 4th-largest real estate website by Nielsen NetRatings. The U.S. Metropolitan Foreclosure Market Report provides the total number of properties entering some stage of foreclosure in large MSAs. This report includes properties in all three phases of foreclosure: pre-foreclosures, foreclosures; and real estate owned, or REO properties (that have been re-purchased by a bank). The combined report, therefore, overstates the number of properties actually entering a single stage of the foreclosure process. However, it appears to be the best available data for a large number of MSAs, and there are no a priori reasons to expect overestimations of foreclosures to vary by MSA.

[4] Subprime lenders are identified by the U.S. Department of Housing and Urban Development as lenders specializing in making subprime loans. Subprime loans are loans to borrowers with imperfect credit. Subprime loans have foreclosure rates that are on the order of 10 to 40 times higher than prime loans (Immergluck, 2006a).

have relatively lower median property values. Some of the metropolitan areas which noticeably break from this pattern (e.g., Detroit, Columbus, and Atlanta) are regions with relatively weaker housing markets and are at the lower end of the higher-value spectrum, especially when compared to the high-value and high-appreciation markets of California.

Metros with high and increasing property values have not suffered the large increases in foreclosures that have accompanied increased subprime lending in many other cities. If a homeowner runs into trouble with paying her mortgage in a hot housing market, she can often sell the house at a profit that is sufficient to pay off the mortgage. So, in areas where property is appreciating rapidly, foreclosures do not tend to be a severe problem. However, this pattern does not mean that high-appreciation metros will necessarily continue to follow the trajectory indicated by the dotted oval. If the regional economies in these areas slow or housing prices decline, foreclosures are likely to follow, just as they have in the dashed oval metros. While foreclosure rates were still relatively low in California in early 2006 compared to other states, they have been increasing and various indicators suggest the California housing market is cooling, including significant increases in unsold inventories (California Realtors Association, 2006). Moreover, even if foreclosures are not occurring in large numbers, loan distress may still be occurring, including distress that results in some people selling their homes and relocating.

It is important to point out that this analysis is dealing with metropolitan ratios and medians. In many large cities with strong housing markets, there remain neighborhoods in which housing markets lag far behind metropolitan trends. Duda and Apgar (2004) found that even in Los Angeles, some minority and lower-income neighborhoods experienced fairly high

rates of foreclosures. In such neighborhoods, foreclosure responses to higher-risk lending may look much more like that of the slower-growth cities.

Overall, the foreclosure problem is particularly severe in modest-income and minority neighborhoods, especially in metropolitan areas that are experiencing slow or moderate property appreciation. In the Chicago area, for example, neighborhoods with 90 percent or greater minority populations experienced an increase of 544 percent in nongovernment-insured foreclosures from 1995 to 2002 – a period of large increases in foreclosures – compared to an increase of 215 percent in neighborhoods with minority populations of less than 10 percent (Immergluck and Smith, 2005). Neighborhoods with 90 percent or more minority residents accounted for 40 percent of the 1995-2002 increase in nongovernment-insured foreclosures. These same tracts represent only 9.2 percent of the owner-occupied housing units in the region. Tracts with 50 percent or greater minority populations accounted for more than 61 percent of the increase in conventional foreclosures.

The Foreclosure Process

Foreclosure is the process through which a lender uses its legal rights to take possession of a property. In general, the process requires the lender to file a notice of foreclosure, or *Lis Pendens*, with the local county government. State law typically requires the lender to issue notice to the borrower of intent to foreclose through methods prescribed by the statute. This may involve sending notice via certified or registered mail. The amount of time that the notice must be mailed out in advance of the sale varies by state, but can be as short as two weeks. Generally, foreclosure notices must also be published in some specified

publication. It is from these publications that private vendors often gather and aggregate foreclosure data.

Assuming the mortgage is not paid off prior to the sale date, the foreclosure sale proceeds, usually on a regularly scheduled date each month. In nonjudicial foreclosure states, foreclosure sales are handled by agents for the lenders – typically attorneys – but may be conducted at a public building, such as a courthouse. In judicial foreclosure states, foreclosure sales are overseen by the courts.

Foreclosure sales are generally conducted as auctions, where the lender/seller accepts the highest bid from one or more bidders at the auction. In most cases, however, the lender is the only bidder on the property and essentially purchases the property from itself for the price of the outstanding debt. The property than becomes what is called "real estate owned" (REO) property.

It is important to understand that mortgage defaults do not always lead to REO properties. The borrower, for example, may "cure" the delinquency or default prior to a foreclosure filing either by paying off the past due amount or by selling the property and prepaying the balance due. During this period, either the borrower or the firm servicing the loan for the lender may attempt to approach the other party about possible alternatives to foreclosure. These generally include: forbearance, in which the lender agrees to refrain from foreclosure for a specified period of time (often while the borrower makes reduced payments); loan modifications or "work-outs" (e.g., reamortizing the loan over a longer period of time); "deed in lieu of foreclosure," in which the borrower just conveys title to the lender; or a "short-sale," in which the lender allows the borrower to sell the property to a third party for

something less than the full mortgage and the remaining balance is forgiven. In practice, the last two foreclosure alternatives tend to be the most common.

If a borrower fails to identify an alternative to foreclosure that is agreeable to the lender, the lender then chooses whether it wants to file the foreclose notice and initiate the foreclosure process. A lender may choose not to initiate foreclosure if it views the costs and risks associated with owning the property as REO as exceeding the expected net sale price of the property, especially after considering selling and carrying costs of property. Risks of assuming ownership involve not only uncertainties around the value of the property but also potential liabilities that a vacant property might entail, especially if owned over a substantial period of time. If the lender does not foreclose, and the borrower remains delinquent, the property may become what is known as a "walk away" and is generally at very high risk to become abandoned and blighted, particularly in weaker market areas.[5]

After a lender initiates foreclosure, the borrower can still avoid the foreclosure sale through selling the property or through one of the foreclosure alternatives listed above. If borrowers are able to obtain a price for their property that exceeds the balance on the loan, it is generally in their interest to sell the house prior to the foreclosure sale. Should a third party purchase the house at the foreclosure sale for more than the mortgage balance, the homeowner is entitled to the net proceeds. However, a variety of features of foreclosure auctions generally make it difficult for properties to sell at such auctions for their fair market value (Nelson and Whitman, 2004). Again, at this stage, the lender may view taking the property as REO to be an unwise decision and may choose not to complete the foreclosure process.

[5] Another scenario involves the lender foreclosing and taking possession of the property as REO but not filing the deed with the county. This makes it difficult for local officials and community groups to identify the owner of the property. The lender may attempt to resell the property before filing any record of ownership with the county. In Ohio, proposals have been put forward to require lenders to file deeds within 30 days of taking possession of property (Dutton, 2005).

In addition to selling the house, the other way the borrower can completely pay off the existing debt on the house is to obtain a refinance loan. Frequently, mortgage brokers and lenders obtain public lists of foreclosure filings and then market refinance loans to borrowers who have entered the foreclosure process as a way for them to pay off the existing lender and thereby preserve their ownership of the home. However, unless the loan substantially reduces their monthly mortgage payments for a substantial period of time, such a loan is likely to merely defer the borrower's problems and result in the new lender eventually foreclosing as well. In the meantime, the borrower may have even lost even more equity in the home due to the costs of repeated financings.

Another legal process affecting individuals with credit problems – bankruptcy – can interact with the foreclosure process. In particular, Chapter 13 bankruptcy has the effect of staying the foreclosure and essentially "freezing the clock" in the foreclosure process. If a satisfactory bankruptcy plan is formulated that the bankruptcy trustee views as a reasonable and feasible attempt to repay any arrearages and become current on the mortgage, lenders are essentially prohibited from proceeding to the foreclosure sale. If borrowers do not abide by the bankruptcy plan, however, lenders can petition for release from the plan in order to resume the foreclosure process. In some cases, then, bankruptcy can be used to provide borrowers with a true alternative to foreclosure. In other cases, however, bankruptcy will effectively only delay the overall process.

Generally, there are three fundamental characteristics of the foreclosure process that vary across states. First, while all states permit lenders to utilize a court-supervised, or judicial, foreclosure process, many states allow lenders to choose an alternative, nonjudicial, or power-of-sale process. In practice, where the nonjudicial process is available, it is the one

used by lenders. Twenty-nine states, including all but five states west of the Mississippi River, permit nonjudicial foreclosure. The second characteristic of foreclosure law that varies by state is the statutory right of post-sale redemption. This provides for some period of time after the foreclosure sale – the post-sale redemption period – during which a borrower can still regain title to the property if they can come up with the foreclosure sale price plus related expenses. Statutory right of redemption occurs in nine states, many of which are located in the Great Plains. While this might be viewed as effectively extending the foreclosure period, redemption is rarely exercised (Pence, 2006). The final characteristic of state foreclosure law that varies across states is whether the law allows for "deficiency judgments," in which the lender is allowed to pursue legal judgments to acquire assets from the borrower when the lender experiences losses after the foreclosure is complete. Nine states forbid such judgments. Pence (2006) argues that differences in the length and complexity of the foreclosure process are essentially the result of whether a state is a judicial or nonjudicial state. This is because post-sale rights of redemption are rarely exercised and deficiency judgments are rarely pursued.

In the case of comparing Illinois and Georgia, both states allow deficiency judgments and do not have a post-sale statutory right of redemption. Therefore, the key differences between the states are the costs and time involved in the foreclosure process. Both of these are, to some degree, related to the judicial vs. nonjudicial processes. Wood (1997) finds that judicial foreclosures take 148 days longer on average than nonjudicial foreclosures. RealtyTrac.com, a major real estate industry web portal, lists Georgia as having the second-fastest foreclosure process (37 days) and Illinois as having the second slowest (300 days) among all states (RealtyTrac.com, 2006a).

The Private and Social Costs of Foreclosures

Foreclosures can entail significant costs and hardships for those most directly affected. Foreclosures can involve losing not only accumulated home equity and the costs associated with acquiring the home, but also access to stable, decent housing. Foreclosures can damage credit ratings, hurting owners' prospects not only in credit markets but also in labor and insurance markets and in the market for rental housing. Lenders too bear some costs in the foreclosure process. Cutts and Green (2004) cite Focardi (2002) in estimating that foreclosure costs average $58,792 and take 18 months to resolve. Of course, the costs lenders bear may or may not be compensated for in the resale of the unit when it is taken into possession and then sold from the lender's REO stock.

The costs of foreclosures affect more than the parties directly involved in the borrowing process. It is these external costs, costs to neighborhoods and localities, which are often missing from discussions of the balance of power between the borrower and lender in the foreclosure process. Foreclosures can have implications for surrounding neighborhoods and larger communities. Cities, counties and school districts may lose tax revenue from abandoned homes. The neighborhood and municipal costs of concentrated foreclosures are starting to be recognized and quantified. These costs increase significantly for properties that are not quickly returned to the market and reoccupied.

In examining FHA foreclosures, Moreno (1995) estimated average city costs due to a foreclosure of $27,000 and neighborhood costs of $10,000. Apgar and Duda (2005) found that the direct costs to city government in Chicago involve more than a dozen agencies and two dozen specific municipal activities, generating governmental costs that in some cases exceeded $30,000 per property.

One potential impact of increased foreclosures in a community is crime. Skogan (1990) argues that abandoned buildings can harm a neighborhood by harboring harbor decay, serving as places where drugs are sold and used, or being used by criminals who attack neighborhood residents. Indirectly, the presence of boarded-up and abandoned buildings may lead to a lack of collective concern by neighborhood residents with neighborhood crime. In examining the relationship between neighborhood foreclosures and crime levels, Immergluck and Smith (2006b) find that higher foreclosure levels do contribute to higher levels of violent crime, with a standard deviation increase in the neighborhood foreclosure rate yielding an increase in neighborhood violent crime of approximately 6.7 percent.

If foreclosures do have negative impacts on neighborhoods, then it is expected that they would have a depressive effect on nearby property values. Immergluck and Smith (2006a) find such an effect in their analysis of Chicago foreclosures. They estimate that each conventional foreclosure within an eighth of a mile of a single-family home results in a 0.9 percent decline in value.

Important components of the solution to the problem of persistent and concentrated foreclosures may involve increased mortgage lending regulation, improved access to responsible subprime credit, and other initiatives. However, the magnitude of the problem and the slow pace of policy change in the regulatory arena call for mixed strategies – including efforts to reduce the negative impacts of foreclosures on the neighborhoods in which they are situated. If streamlining the foreclosure process is likely to reduce the number of foreclosures that result in vacant or blighted properties, then such efforts may merit serious consideration. Of course, any such benefits must be balanced against any increased risks or costs to homeowners threatened with foreclosure.

Faster or Slower? Which Foreclosure Process is Better for Neighborhoods?

State foreclosure laws vary greatly in terms of how long the process takes from notice to sale. Figure 2 shows the foreclosure periods estimated for states by RealtyTrac.com (2006b). According to these estimates, Illinois has the second longest notice-to-sale period, and Georgia has the second shortest. Illinois is also a judicial foreclosure state, while Georgia is a nonjudicial state.[6] Judicial states are generally considered to be more protective of the borrower and are seen as imposing higher foreclosure costs on lenders (Clauretie, 1987; Pence, 2006). Pence (2006) estimates that the requirements of judicial foreclosure process increase lenders' costs by approximately 10 percent of the loan balance. This includes building carrying costs, transaction costs and increased devaluation of the property. Of course, such an estimate is an average and a finer estimate might depend on the precise difference in foreclosure periods between two particular states.

Apgar and Duda (2005) identify the substantial costs that foreclosures can entail for local government. In their policy recommendations, they suggest that long foreclosure periods may provide excess opportunities for properties in the foreclosure process to deteriorate, be vandalized, or lose value, thus increasing the probability of foreclosure to lead to vacancy and abandonment.

Whether one expects a speedier and more lender-friendly foreclosure process to increase or decrease the propensity for foreclosures to lead to vacant and abandoned properties depends partly on one's perspective on the foreclosure process. In many traditional

[6] Georgia is a title theory state, in which the borrower technically gives legal title to the lender through the what is called a security deed. The borrower retains "equitable title" and legal title is returned to the borrower only when the debt is paid in full. In theory, the lender actually owns the property until the debt is paid. Technically, the lender has the right to immediate possession of the property if the borrower defaults. As a practical matter, however, foreclosure must be used to take possession of the property

real estate finance models, mortgage default and foreclosure are frequently treated as options problems, with the borrower deciding whether to take the foreclosure option depending on a variety of factors, including his or her equity position in the property. For example, substantial owner equity in a property is generally seen as a negative factor in determining the probability of the owner defaulting and/or exercising his or her foreclosure option. In such models, because nonjudicial foreclosure processes impose more costs on the borrower, they encourage the borrower to seek alternatives to foreclosure, such as a deed-in-lieu of foreclosure or short sale.

Phillips and Rosenblatt (1997) use a traditional options model to find support for judicial states having higher foreclosure rates, other things equal. (Note that this does not address whether speedier foreclosure processes provide borrowers with sufficient time to find *equitable* alternatives to foreclosure.) Others, however, go beyond the borrower-as-decider options model of foreclosures and take into account the lender's incentives and disincentives, recognizing that they play a role in the decision to foreclose or seek alternatives. Clauretie (1987) incorporated the credit supply-side by considering that the higher costs imposed on lenders in judicial foreclosure states may discourage lenders from foreclosing and encourage their use of alternatives. Even if one assumes that alternatives to foreclosure are initiated by the borrower (as Phillips and Rosenblatt do), lenders are certainly likely to adjust their responses to borrower pleas for foreclosure alternatives depending on the costs imposed by different legal contexts. In fact, after controlling for other demand and supply side factors, Clauretie (1987) found that states with judicial foreclosure and longer foreclosure periods have lower foreclosure rates. Clauretie (1987) suggests that this is because more expensive

foreclosure processes deter lenders from foreclosing and encourage them to use alternatives to foreclosure, such as loan modifications, deed in lieu of foreclosure, etc.

While a longer foreclosure period and more complex foreclosure process may increase opportunities for property deterioration and vacancy, it may also provide homeowners with more opportunities to obtain the financial resources needed to cure the default, or the to negotiate a loan modification (perhaps with legal assistance), or to sell the house at a price sufficient to pay off the mortgage. Moreover, as Clauretie (1987) suggests, a more expensive foreclosure process (which is associated with a longer foreclosure period) may encourage lenders to utilize alternatives to foreclosure -- alternatives that might be employed after the initial foreclosure filing. If this is the case, then those initiating foreclosures in states with longer and more complex foreclosure procedures may be less likely to complete the foreclosure process.

In addition, some have suggested that lender-friendly foreclosure procedures and short foreclosure periods encourage higher-risk lending.[7] While not addressing credit risk directly, Pence (2006) found that loan sizes are larger in states with lender-friendly foreclosure laws. While she interprets this as a negative impact of stronger foreclosure laws because borrowers are more constrained in the amount they can borrow, others may interpret her findings differently. Higher-risk lenders are likely to lend at higher debt-to-income ratios. Thus, Pence's findings are consistent with a scenario in which more aggressive, riskier lenders market more aggressively in states with lender-friendly foreclosure laws. Whether this outcome is perceived as in the public's interest is, of course, likely to be a point of debate.

[7] For example, the president of Consumer Credit Counseling Services of Atlanta was quoted in the *Atlanta Journal Constitution* (Hairston, 2006) as saying, "Our state is very attractive to lenders, and part of that is our non-judicial foreclosure process. There have been a number of incredibly aggressive products [loans] marketed to consumers over the past five to eight years. Now we're starting to see the fallout of that aggressive marketing.

For a variety of reasons then, the anticipated effect of foreclosure periods on the tendency of foreclosures to lead to vacancy is somewhat ambiguous.[8] The objective here is to attempt to detect whether foreclosures appear to have substantially different effects on vacancy in two states with very different foreclosure processes and timelines.

Methodology

Reliable, neighborhood-level data on foreclosures are not available on a routine basis. However, it is fortunate that two private firms have been gathering data on foreclosure filings in the Chicago and Atlanta areas, respectively, for some time. The basic model used here is a change-over-time model, transformed so that the ending level of the outcome variable (off-market vacancy rate) is the dependent variable and the initial level is an independent variable. For each metropolitan area, separate estimations are run of the following model using data aggregated by census tracts in the region:

$$V_{2000} = \alpha + \beta V_{1990} + \chi \mathbf{P}_{1990} + \delta (\mathbf{P}_{2000}-\mathbf{P}_{1990}) + \gamma \mathbf{H}_{1990} + \lambda (\mathbf{H}_{2000} - \mathbf{H}_{1990}) + \omega \sum_{j=1997}^{1999} F_j + \varepsilon \qquad (1)$$

where V is the proportion of housing units that are "off-market vacant," i.e., not for sale or rent and not seasonally occupied, as measured by the decennial census. **P** is a vector of population characteristics, **H** is a vector of housing stock characteristics, and F_j is the foreclosure rate (foreclosures divided by single-family buildings) for year j in the tract. The 1997 to 1999 year period is chosen because data on foreclosures of sufficient quality are available for both metropolitan areas for these years. Moreover, the three years of foreclosures

[8] It may be, for example, that both very brief and very long foreclosure periods contribute to housing vacancy

preceding 2000 should have the most influence on vacancy in 2000. Finally, in both of these regions, foreclosures increased significantly in the late 1990s, so that foreclosures over these years made up the bulk of foreclosures in the last half of the decade.

By comparing the estimates of φ from the separate Cook County and Atlanta area regressions, we can determine whether the effect of foreclosures on vacancy rates differs across the two cities. If $\varphi_{Cook\ County}$ is substantially larger than $\varphi_{Atlanta}$, this would provide some support for an argument that longer foreclosure periods may lead to more off-market vacant properties. However, if $\varphi_{Cook\ County}$ is substantially less than $\varphi_{Atlanta}$, then it may be that quicker foreclosure periods actually exacerbate off-market vacancy. If $\varphi_{Cook\ County}$ and $\varphi_{Atlanta}$ are roughly equivalent then neither of these notions receives substantial support. There may be differences between Cook County and the five-county Atlanta area besides foreclosure processes that may affect the relationship between foreclosures and vacancy that I am not able to capture with available data. However, the difference in foreclosure processes in the two regions is so stark that, if foreclosure period does have a substantial impact on the outcomes of properties entering foreclosure, it is reasonable that some difference in the φs should be detected.

Data

The ultimate sources of data used in the estimations of equation (1) were compiled from three primary sources: 1) 1990 census tract data; 2) 2000 census tract data; and 3) foreclosure data from the two private foreclosure data vendors. Because some census tract boundaries changed over the 1990s – especially in the Atlanta area – 1990 data were obtained

from the Urban Institute's Neighborhood Change Database, which provides estimates of 1990 census data by 2000 tract boundaries. The foreclosure data came from two different private vendors, and both sets of data required some cleaning and geocoding at the address level

In the case of Atlanta, data were obtained for the five core counties in metropolitan Atlanta, including Fulton, DeKalb, Gwinnett, Clayton, and Cobb. The Atlanta vendor of foreclosure data could provide high quality foreclosure data for these five counties dating back to 1997. Data were obtained for 1997 through 1999. After removing duplicate addresses, which include multiple foreclosure filings on the same property, over 24,000 foreclosed properties remained for the three year period. Then, all properties that were not single-family properties were removed from the data set, leaving just over 23,000 records. Geocoding these records (success exceeded 95 percent) yielded a final set of foreclosed properties of 22,580. These were then aggregated by census tract.

A similar process was applied to the Cook County foreclosure data. After removing duplicate foreclosures on the same addresses and nongeocoded properties (geocoding success exceeded 95 percent), there remained 30,805 foreclosed properties for the 1997 to 1999 period. These were then aggregated by census tract. Tract-level foreclosure rates are developed by taking the three-year sum of foreclosures and dividing this sum by an estimated number of 1-4 unit residential properties (generally called single-family properties in this paper) in the census tract in 2000. The census data provide exact counts for the number of housing units in one and two-unit properties but aggregate the number of units in three and four unit buildings. Thus, to obtain the estimated number of single-family properties, the number of three and four unit properties is divided by 3.5 and that is added to the number of

detached and attached 1-unit properties and the number of two-unit properties, which are calculated precisely from the census data.

The numerator for the dependent variable in equation 1 – the off-market vacancy rate – is equal to the "other vacant units" figure in the census data, which is equal to the number of vacant housing units less those "for rent" or "for sale only," and less any vacant units known to be seasonally or occasionally occupied.

After aggregating the foreclosure rates and census data descriptors of the census tracts for Cook County and the five-county Atlanta core, census tracts with very few (less than 50) single-family properties were omitted from the two data sets. In Cook County there are 1,344 such tracts. Of these, 36 have no single-family buildings and another 74 had fewer than 50 single family buildings in either 1990 or 2000. These 110 tracts were excluded from the data set. This left 1,234 tracts with at least 50 single family buildings in both 1990 and 2000. In the 5-county Atlanta metropolitan area, there are 478 tracts. Of these, two had no single-family buildings and 9 more had fewer than 50 properties in either 1990 or 2000. This left 467 tracts with at least 50 single-family properties in both 1990 and 2000 in the five-county Atlanta area.

Ordinary Least Squares and Negative Binomial Methods

The basic model in equation (1) can, in principal, be estimated via ordinary least squares (OLS) regression. However, vacancy rates in both metropolitan areas are skewed toward very low values and so not normally distributed. One common approach to dealing with data skewed in this way is to perform a logarithmic transformation of the dependent variable. Figure 1 describes the distribution of vacancy rates in Cook County as well as a log

transform of these rates.[9] While the transform deals nicely with tracts with nonzero vacancy rates, resulting in a normal distribution of vacancy rates for these tracts, there remains the problem of the large zero-value spike. The traditional method for dealing with incidence data in which there are significant numbers of zero and large numbers of low values is Poisson or negative binomial regression.

In this paper, I first estimate a version of equation 1) using a log-transform of the dependent variable for each core metropolitan area, after omitting (or censoring) tracts which had zero vacancy in 2000. Normally, censoring data is not a desirable practice and can lead to substantial problems. However, one might argue that tracts with zero vacancies in 2000 are really not a part of the population of interest here, in that we expect that foreclosures are unlikely to have any material impact on the off-market-vacancy rate of a tract with no such vacancies, since the housing market is likely to be so strong that it can easily absorb foreclosure activity. In the case of Cook County, omitting tracts with zero off-market vacancies involved excluding 264 census tracts, or about 21.4 percent of the total. In the case of the five-county Atlanta area, 123 tracts, or about 26.4 percent of the tracts, had a vacancy rate of zero in 2000 and were excluded.

Because the number of tracts with no off-market vacancies is substantial, I employ, as an alternative specification, a negative binomial regression in which the number of off-market vacancies is regressed on the number of housing units in the neighborhoods, as well as the same neighborhood characteristics as in the OLS estimations (discussed later and shown in Table 2), including the tract foreclosure rate. In these regressions, however, the zero-vacancy tracts are included. The OLS results, because they utilize a logged dependent variable, yield

[9] The transformed variable was actually equal to Ln(vacancy rate + 0.0001) to deal with any zero values for the corresponding 1990 independent variable

coefficients that measure the expected proportional change in the vacancy rate for a one-unit change in the independent variable. The negative binomial results yield coefficients, which after exponentiation, measure the expected proportional change in the number of vacancies due to a one-unit change in the independent variable. Thus, while not entirely comparable, the two results can be compared somewhat directly. As will be shown, however, the two methods yield different results. This is somewhat expected, given the substantial censoring of the data in the OLS results and the fundamentally different assumptions of the two regression techniques.

OLS Results

Table 1 provides a side-by-side comparison of the descriptive statistics for the dependent and independent variables used in the estimation of equation 1 for Cook County and the Atlanta core counties, respectively. The independent variables used in the models consist of data on economic vitality, stability, and housing stock characteristics, including proportion of persons in poverty, median family income, proportion of persons residing in the same housing unit five years ago, population density, median home value, proportion of units that are owner occupied, proportion over 50 years old and proportion less than five years old. Unemployment rate was also initially tested, but because it did not come in significant and expressed some relatively high correlations with other independent variables it was not retained. (Its inclusion did not materially impact the results described below.) For all the characteristics implemented as independent variables, a change over time (1990-2000) measure was also employed as shown in equation (1). Finally, the initial, 1990 level of off-

market vacancy was included as an independent variable as was the foreclosure rate for the 1997 to 1999 period.

Table 1 shows that the off-market vacancy rate for nonzero vacancy tracts averaged 3.2 percent in Cook County in 2000 versus 2.2 percent in the Atlanta area. In fact, the average nonzero off-market vacancy rate in Atlanta tracts dropped from 2.5 to 2.2 percent from 1990 to 2000, while it increased somewhat in Cook County from 2.8 to 3.2 percent. Over the same period, the average median home value grew somewhat faster in Cook County ($72,200 over a 1990 median of $105,300) compared to the 5-county Atlanta area ($56,600 over a 1990 median of $99,900). However, the average owner occupancy rate for the Atlanta area tracts grew by 2.3 percentage points compared to 1.3 percentage points in Cook County.

Among the most interesting findings in Table 1 is the fact that the average number of foreclosures (1997-1999) per single-family building for census tracts in the two areas was almost identical. The most striking difference between the census tracts in these two regions in terms of housing characteristics is density. Cook County tracts had an average population density of almost five thousand households per square mile in 1990, and this increased by 220 households per square mile over the 1990s. In the Atlanta area, the average density was just over one thousand households per square mile in 1990. However, this figure increased fairly rapidly over the 1990s, with an increase of 170 households per square mile as growth in places like Gwinnett County accelerated. Another substantial difference between the two areas is the age of the housing stock. In 1990, 9 percent of Cook County units were over 50 years old. But by 2000, this figure reached 45 percent due to the large amount of housing built in the 1940s. In the Atlanta area, however, only 4 percent of all units in 1990 were over 50 years old and that number had risen to only 12 percent by 2000.

Table 2 gives the results of the OLS estimations of equation 1 for Cook County and the 5-county Atlanta area. Again, these regressions required the omission of between 21.4 percent and 26.4 percent of tracts in Cook County and the Atlanta area, respectively, due to zero-level vacancy rates, whose inclusion would violate the assumption of a normally distributed dependent variable required by OLS.

The OLS results are relatively consistent across the two cities, with some differences in magnitudes and statistical significance. It is important to point out that statistical significance depends upon the size of the corresponding data set and, in general, a larger number of tracts is expected to result in smaller standard errors for coefficient estimates and, thus, more instances in which coefficients are found to be statistically significant.

In the OLS results, the coefficients have the same signs for both the Cook County and Atlanta area regressions for all but four (change in poverty, change in median family income, median home value in 1990, and change in home value) of the 18 independent variables. For most variables, the coefficients are of the same order of magnitude and sometimes they are quite close in value. However, there are also several variables for which there are large differences in coefficient magnitude, including change in the proportion of persons residing in the same unit 5 years earlier, change in households per square mile, and change in the proportion of units over 50 years old.

With respect to the key variable of interest, foreclosures per single-family building, the results are relatively consistent across the two cities. The variable is statistically significant at less than 0.10 for both areas. The result for Cook County is significant at a much higher level (<0.01), due largely to a much lower standard error. In terms of magnitude, the coefficient in the Cook County regression is approximately 15 percent larger than in the

Atlanta area regression. In the case of Cook County, an increase of 0.01 in the ratio of 1997-1999 foreclosures per single-family building (compared to a mean of 0.034 and standard deviation of 0.033), yields an expected 4.9 percent (*not* percentage-point) increase in the proportion of housing units that are off-market vacant. At the mean 2000 vacancy rate of 3.2 percent for Cook County, this would mean an increase to 3.36 percent vacant. A standard deviation change (0.033) in this key variable in Cook County would yield an expected 16.4 percent increase in the proportion of housing units that are off-market vacant. At the mean 2000 rate of 3.2 percent, this would mean an increase to 3.72 percent vacant. (Of course, this assumes all the other characteristics of the tract are held constant.)

In the case of the 5-county Atlanta area, the impacts are similar, though somewhat smaller in magnitude. An increase of 0.01 in the ratio of 1997-1999 foreclosures per single-family building (compared to a mean of 0.035 and standard deviation of 0.029), yields an expected 4.3 percent (*not* percentage-point) increase in the proportion of housing units that are off-market vacant. At the average of 2.2 percent off-market vacancy for the Atlanta area in 2000, this would mean an increase to 2.29 percent. A standard deviation change (0.029) in this key variable in Atlanta would yield an expected 12.5 percent increase in the proportion of housing units that are off-market vacant. At the mean 2000 rate of 2.2 percent, this would mean an increase to 2.47 percent. (Of course, this assumes all the other characteristics of the tract are held constant.)

Negative Binomial Results

Because a substantial portion of census tracts in both the Cook County and 5-county Atlanta core had no off-market vacancies in 2000, the dependent variable is not normally

distributed and a log-transform of all tracts does not rectify this problem without excluding tracts with zero vacancies (See Figure 1). This is a common situation with incidence data with low modal values. The standard approach for modeling incidence or count data such as off-market vacant housing units is to use either a Poisson or negative binomial regression. In cases such as this one where the data are over-dispersed, so that the variance of the dependent variable exceeds its mean, the appropriate method is negative binomial regression.

Table 3 provides descriptive statistics for the variables used in the negative binomial estimation of tract-level vacancies. Again, the numbers of observed tracts is larger here than in Table 2 because tracts with zero off-market vacancies are not excluded. Table 4 provides the results of the negative binomial regressions for the Cook County and Atlanta area data sets. It shows that, in the negative binomial results, there is somewhat less consistency between the results for the two metropolitan areas. For 10 of the 19 independent variables, the signs of the coefficient estimates are the same for the two regressions. (There is one additional independent variable in the negative binomial models due to the use of a count variable as the dependent variable and, thus, the need to control for total housing units on the right hand side.)

Table 5 provides a comparison among the coefficients for the OLS and negative binomial regressions. In the Cook County regressions, for only two of the 18 variables (not counting the intercept) do the signs of the coefficients vary when comparing the two methods. Of the twelve coefficients (not counting the intercept) that were statistically significant in the OLS results, eight were of the same sign and statistically significant in the negative binomial results. Only one of the coefficients that were not significant in the OLS results was

significant in the negative binomial results. Overall, the Cook County results were fairly robust across the two methods.

The Atlanta results were somewhat less robust across the two methods. For 5 of the common 18 variables, the signs of the coefficients vary across methods. Of the 7 variables that have a significant coefficient in the OLS results, 4 are also significant and of the same sign in the negative binomial estimation. Of the 11 variables with insignificant coefficients in the OLS results, 4 were significant in the negative binomial results.

For the key variable of interest, the number of foreclosures per single family building, both regressions again show a positive effect on vacancy. However, in the negative binomial regression, the coefficient on foreclosure rate is significant only in the Cook County results This is, however, due to the larger standard error in the Atlanta area results. In fact, the coefficient in the Atlanta results is actually substantially larger than in the Cook County regression (4.7 versus 2.8).

Interpreting the coefficients in negative binomial regression involves examining the exponentiated form of the coefficients, which are equal to the proportional increase in the expected value of the dependent variable due to a one-unit increase in the independent variable, other things held constant. Thus, the Cook County results suggest that increasing the foreclosure ratio by 0.01 would increase the number of vacancies in a tract by 16.4 percent (16.3954*0.01), a larger effect than that suggested by the OLS results. The exponentiated coefficient in the Atlanta area results is substantially larger, but it is not statistically significant. However, the smaller number of observations in the Atlanta data set results constrains the statistical power of the analysis, inflating the standard error of the coefficient estimate, thereby resulting in a statistically insignificant result.

Conclusions

The results of the OLS and negative binomial regressions for Cook County and the Atlanta area yield two broad findings. First, the results consistently support the notion that higher neighborhood foreclosure rates yield higher off-market vacancy levels. This result is quite robust. However, regarding the principal research question that the paper seeks to address - whether the much longer foreclosure period in Illinois increases the propensity of higher foreclosure rates to raise off-market vacancy levels – the results are somewhat ambiguous. Certainly, the results here do not provide strong support to the notion that shorter foreclosure periods should reduce off-market vacancies resulting from high foreclosure rates

The censored OLS results, which in some ways are less statistically defensible than the negative binomial results, provide some support for the notion that the impact of foreclosures on vacancy may be somewhat higher (15 percent) in Cook County than in the Atlanta area. Unlike the OLS results, however, the negative binomial results suggest that the effect of foreclosures on off-market vacancies may be considerably larger in Atlanta than in Cook County. However, the Atlanta coefficient is not statistically significant due to the smaller number of tracts and larger standard error.

The results of this paper do not provide strong support for streamlining the foreclosure process as a means of reducing the vacancy- and abandonment-inducing effects of foreclosures. In fact, the negative binomial results imply the opposite that longer foreclosure periods may reduce the vacancy effects of foreclosures. However, more research on this topic is needed.

One major improvement in the research would be to identify one or more single multi-state metropolitan areas in which forec osure processes are substantially different in leng.h

between at least two of the states and conduct unified regression analyses. However, this requires the availability of quality foreclosure filing data across such metropolitan areas. Obtaining good foreclosure data for bi- or multi-state metropolitan areas is not without significant challenges.

The ideal data set for investigating the impact of foreclosures across foreclosure regimes would be property-level data that allowed one to follow the disposition of many individual properties over time, including data that signaled vacancy and abandonment such as tax delinquency. Such data, if available across states with very different foreclosure periods, could be used to test the impact of foreclosure periods on vacancy and abandonment As is the case with good foreclosure data generally, however, such data are scarce.

Another alternative would be to do case-study forensics of a set of abandoned properties in two or more foreclosure regimes. This could be quite time-intensive however and may not yield many highly generalizable findings.

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Table 1. **Descriptive Statistics for Census Tracts with Nonzero Nonmarket Vacancy Rates, 2000**

	Mean		Standard Deviation	
	Cook County	5-County Atlanta Area	Cook County	5-County Atlanta Area
Proportion of Units that were Off-Market Vacant in 2000	0.032	0.022	0.044	0.041
Proportion of Units that are Off-Market Vacant in 1990	0.028	0.025	0.032	0.031
Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990	0.57	0.44	0.13	0.13
Change in Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990- 2000	0.005	-0.003	0.09	0.10
Proportion of Persons in Poverty, 1989	0.17	0.13	0.16	0.14
Change in Proportion of Persons in Poverty, 1989-1999	-0.007	0.004	0.08	0.07
Median Family Income 1989 ($ thousands)	37.59	41.98	18.77	20.13
Change in Median Family Income ($ thousands) 1989-1999	16.33	17.22	13.89	15.16
Thousands of Households per Square Mile, 1990	4.95	1.05	4.69	0.88
Change in Thousands of Households per Square Mile, 1990-2000	0.22	0.17	1.26	0.39
Median Home Value ($10 thousands), 1990	10.53	9.99	7.85	6.48
Change in Median Home Value ($10 thousands), 1990-2000	7.22	5.66	7.24	5.25
Owner-Occupancy Proportion, 1990	0.51	0.53	0.26	0.24
Change in Owner-Occupancy Proportion, 1990-2000	0.013	0.023	0.06	0.09
Proportion of Units 50+ Years Old, 1990	0.09	0.04	0.08	0.05
Change in Proportion of Units 50+ Years Old, 1990-2000	0.36	0.08	0.21	0.10
Proportion of Units Less than 5 Years Old, 1990	0.03	0.19	0.07	0.13
Change in Proportion of Units Less than 5 years Old, 1990-2000	-0.002	-0.071	0.067	0.143
1997-1999 Foreclosed Properties Per Single Family Building	0.034	0.035	0.033	0.029
N	972	344		

Table 2. Ordinary Least Squares Regression of Off-Market Vacancy Rate, 2000

(excludes tracts where off-market vacancy rate = 0% in 2000)

Dependent Variable = Ln (Proportion of Housing Units the are Off-Market Vacant in 2000 + 0.00001)

	Unstandardized Coefficients (B)		Standard Error		Standardized Coefficients (Beta)		Significance Level	
	Cook County	Atlanta Area	Cook County	Atlanta Area	Cook County	Atlanta Area	Cook County	Atlanta Area
(Constant)	-5.5120	-4.9104	0.2293	0.3815			0.000	0.001
Ln(Proportion of Units that are Off-Market Vacant in 1990 + 0.00001)	0.0433	0.0994	0.0116	0.0332	0.0868	0.1483	0.000	0.003
Proportion of Persons 5+ Residing in Same Unit 5 Years Ago	1.3951	1.0816	0.3484	0.7625	0.1567	0.1307	0.000	0.157
Change in Proportion of Persons 5+ Residing in Same Unit 5 Years Ago 1990-2000	-0.2680	-0.0184	0.3541	0.7645	-0.0219	-0.0018	0.449	0.981
Proportion of Persons in Poverty 1989	2.9162	2.5050	0.3647	0.7231	0.4193	0.3412	0.000	0.001
Change in Proportion of Persons in Poverty, 1989-1999	1.7260	-0.0968	0.4418	0.8885	0.1211	-0.0062	0.000	0.913
Median Family Income 1989 ($thousands)	0.0028	0.0075	0.0033	0.0080	0.0462	0.1430	0.402	0.351
Change in Median Family Income 1989-1999 ($thousands)	-0.0002	0.0026	0.0027	0.0054	-0.0023	0.0367	0.945	0.635
Households per Square Mile (thousands), 1990	-0.0313	-0.0232	0.0072	0.0741	-0.1298	-0.0193	0.000	0.755
Change in Households per Square Mile (thousands), 1990-2000	-0.0013	-0.3353	0.0209	0.1491	-0.0014	-0.1235	0.951	0.025
Median Home Value ($10 thousands), 1990	-0.0030	0.0035	0.0067	0.0189	-0.0207	0.0213	0.655	0.854
Change in Median Home Value ($10 thousands),1990-2000	.0111	-0.0337	0.0048	0.0163	0.0713	-0.1675	0.020	0.040
Owner-Occupancy Proportion, 1990	-0.8070	-1.0159	0.2710	0.5145	-0.1877	-0.2321	0.003	0.049
Change in Owner-Occupancy Proportion, 1990-2000	-0.7449	-0.4430	0.5287	0.5874	-0.0379	-0.0393	0.159	0.451
Proportion of Units 50+ Years Old, 1990	2.8498	0.5086	0.3821	1.1213	0.2141	0.0244	0.000	0.650
Change in Proportion of Units 50+ Years Old, 1990-2000	0.8932	1.8007	0.1431	0.3956	0.1665	0.2738	0.000	0.000
Proportion of Units Less than 5 Years Old, 1990	1.7828	0.8470	0.6592	0.5763	0.1104	0.1459	0.007	0.142
Change in Proportion of Units Less than 5 years Old	1.2714	0.5189	0.6351	0.5785	0.0758	0.0705	0.046	0.370
1997-1999 Foreclosures Per Single Family Building	4.9436	4.2835	0.9313	2.1951	0.1464	0.1188	0.000	0.052
N	972	344						
R^2	0.580	0.485						

Bold and Underline = significant below 0.01; bold = significant below 0.05; underline = significant below 0.10

Table 3. Descriptive Statistics for Census Tracts, Including Nonzero Nonmarket Vacancy Rates, 2000

	Mean		Standard Deviation	
	Cook County	5-County Atlanta Area	Cook County	5-County Atlanta Area
Number of Units that were Off-Market Vacant in 2000	29.94	27.05	38.33	39.53
Total Housing Units, 2000	1,639	2,435	1,009	1,265
Number of Units that were Off-Market Vacant in 1990	34.80	38.84	38.03	43.28
Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990	0.57	0.44	0.13	0.13
Change in Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990- 2000	0.005	0.003	0.095	0.103
Proportion of Persons in Poverty, 1989	0.16	0.12	0.16	0.14
Change in Proportion of Persons in Poverty, 1989-1999	-0.007	0.005	0.081	0.063
Median Family Income 1989 ($ thousands)	38.13	42.87	19.05	20.18
Change in Median Family Income ($ thousands) 1989-1999	16.88	17.16	14.36	14.33
Thousands of Households per Square Mile, 1990	4.88	1.02	4.66	0.33
Change in Thousands of Households per Square Mile, 1990-2000	0.19	0.19	1.24	0.64
Median Home Value ($10 thousands), 1990	10.72	9.99	8.02	6.10
Change in Median Home Value ($10 thousands), 1990-2000	7.51	5.41	7.68	4.98
Owner-Occupancy Proportion, 1990	0.51	0.54	0.27	0.25
Change in Owner-Occupancy Proportion, 1990-2000	0.02	0.03	0.06	0.10
Proportion of Units 50+ Years Old, 1990	0.09	0.04	0.09	0.05
Change in Proportion of Units 50+ Years Old, 1990-2000	0.35	0.07	0.22	0.15
Proportion of Units Less than 5 Years Old, 1990	0.03	0.20	0.07	0.18
Change in Proportion of Units Less than 5 years Old, 1990-2000	-0.002	-0.084	0.071	0.116
1997-1999 Foreclosed Properties Per Single Family Building	0.033	0.034	0.033	0.028
N	1,234	467		

Table 4. Negative Binomial Regression of Off-Market Vacancies, 2000

(*includes* tracts where off-market vacancy rate = 0% in 2000)

Dependent Variable = Number of Off-Market Vacant Units in 2000

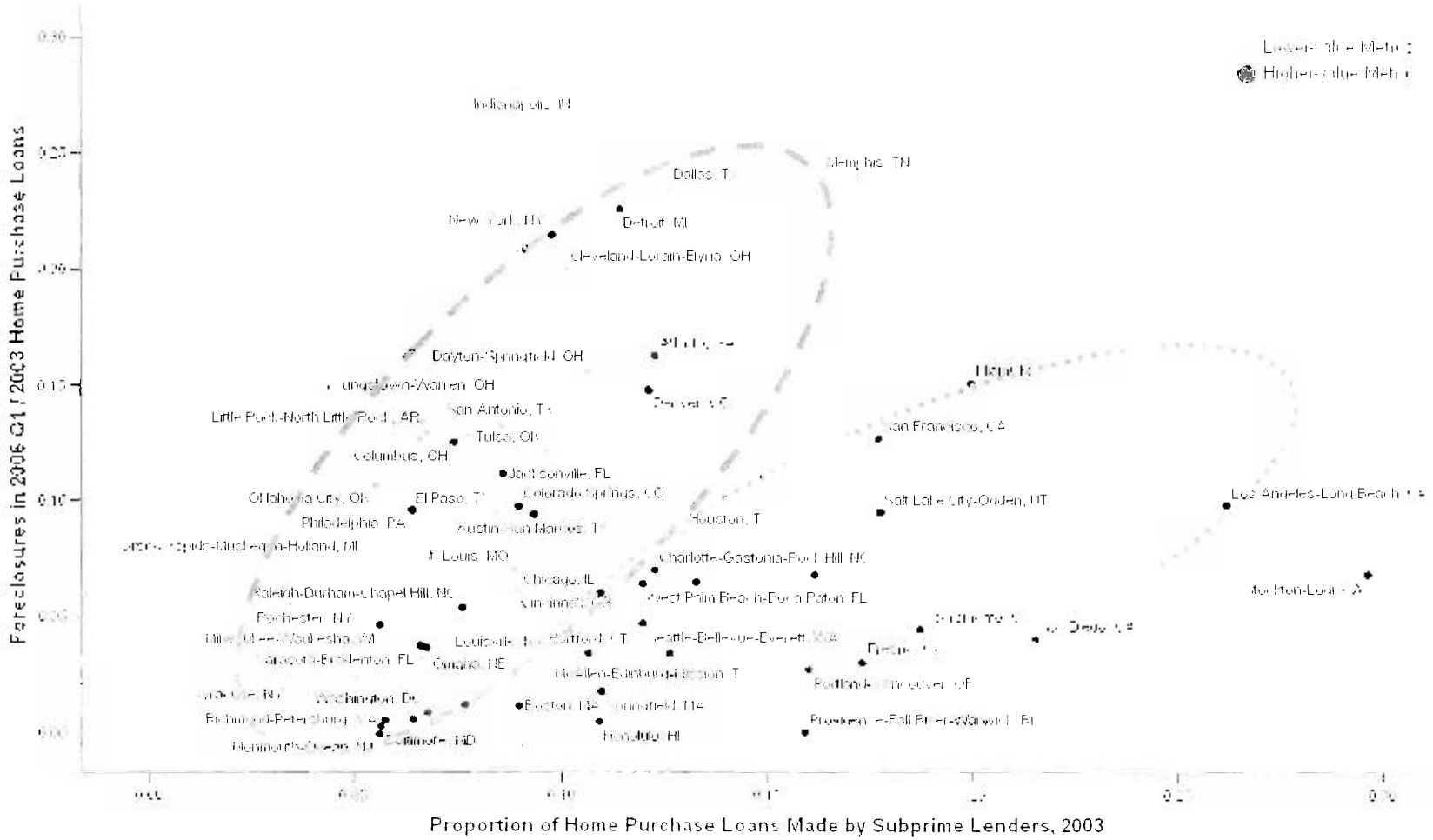
	Coefficients (B)		Standard Error		Exponentiated Coefficients		Significance Level	
	Cook County	Atlanta Area	Cook County	Atlanta Area	Cook County	Atlanta Area	Cook County	Atlanta Area
Constant	1.4010	2.2710	0.3586	0.5872			0.000	0.000
Total Housing Units in 2000	0.0004	0.0003	0.0001	0.0001	1.0004	1.0003	0.000	0.500
Number of Off-Market Vacant Units in 1990	0.0065	0.0042	0.0011	0.0019	1.0065	1.0042	0.000	0.128
Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990	0.5759	2.3530	0.5172	1.1880	1.7787	10.5171	0.266	0.048
Change in Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990-2000	-0.2503	2.0470	0.5260	1.1690	0.7786	7.7446	0.634	0.080
Proportion of Persons in Poverty, 1989	2.1110	-0.3324	0.5671	1.0510	8.2565	0.7172	0.000	0.752
Change in Proportion of Persons in Poverty, 1989-1999	1.0150	-0.7303	0.6457	1.3910	2.7594	0.4818	0.116	0.599
Median Family Income 1989 ($thousands)	0.0055	-0.0094	0.0048	0.0126	1.0056	0.9906	0.250	0.455
Change in Median Family Income ($thousands) 1989-1999	0.0003	0.0023	0.0040	0.0088	1.0003	1.0023	0.931	0.797
Households per Square Mile (thousands), 1990	-0.0282	0.0161	0.0117	0.1209	0.9722	1.0162	0.016	0.894
Change in Households per Square Mile (thousands),1990-2000	0.0092	-0.4953	0.0314	0.1466	1.0092	0.6094	0.771	0.001
Median Home Value ($10 thousands), 1990	-0.0065	0.0268	0.0096	0.0313	0.9936	1.0271	0.500	0.392
Change in Median Home Value ($10 thousands), 1990-2000	-0.0012	-0.0141	0.0067	0.0276	0.9988	0.9860	0.860	0.609
Owner-Occupancy Proportion, 1990	-0.8508	-2.2360	0.3990	0.8131	0.4271	0.1069	0.033	0.006
Change in Owner-Occupancy Proportion, 1990-2000	-1.3690	-2.4140	0.7262	0.8863	0.2544	0.0895	0.059	0.007
Proportion of Units 50+ Years Old, 1990	2.1720	-0.8999	0.5740	1.7690	8.7758	0.4066	0.000	0.611
Change in Proportion of Units 50+ Years Old, 1990-2000	0.7936	1.5740	0.2112	0.6485	2.2113	4.8259	0.000	0.015
Proportion of Units Less than 5 Years Old, 1990	1.1870	2.1340	0.9590	0.9870	3.2772	8.4486	0.216	0.031
Change in Proportion of Units Less than 5 years Old	1.6210	2.4350	0.8842	0.9601	5.0581	11.4158	0.067	0.011
1997-1999 Foreclosures Per Single Family Building	2.7970	4.7130	1.4180	3.0930	16.40	111.39	0.049	0.128
N	1,234	467						
Null Deviance / DF	1,912.2 / 1,233	670.7 / 466						
Residual Deviance / DF	1,487.7 / 1,214	548.8 / 447						
Chi-square:DF	424.5, 19	121.9, 19						
Nagelkerke R-square	0.253	0.205						

Bold and Underline = significant below 0.01; bold = significant below 0.05; underline = significant below 0.10

Table 5. Comparison of Coefficient Signs for OLS and Negative Binomial Results

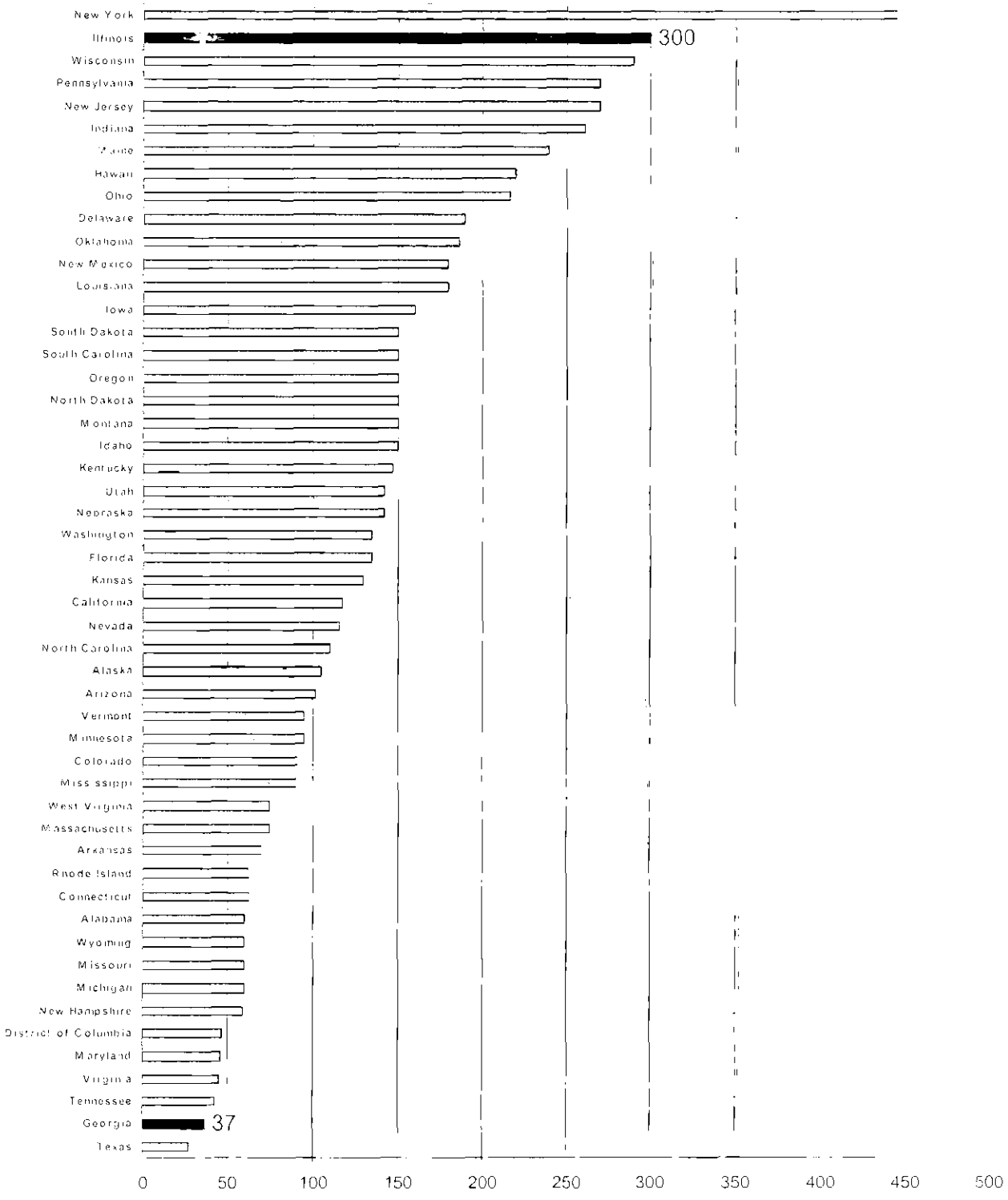
	Cook County		5-County Atlanta Area	
	OLS	Negative Binomial	OLS	Negative Binomial
(Constant)	-5.5120	1.4010	-4.9104	2.2710
Total Housing Units, 2000		0.0004		0.0003
Ln(Proportion of Units that are Off-Market Vacant in 1990 + 0.00001) OR Number of Housing Units that are Off-Market in 1990	0.0433	0.0065	0.0994	0.0042
Proportion of Persons 5+ Residing in Same Unit 5 Years Ago	1.3951	0.5759	1.0816	2.3530
Change in Proportion of Persons 5+ Residing in Same Unit 5 Years Ago, 1990-2000	-0.2680	-0.2503	-0.0184	2.0470
Proportion of Persons in Poverty, 1989	2.9162	2.1110	2.5050	-0.3324
Change in Proportion of Persons in Poverty, 1989-1999	1.7260	1.0150	-0.0968	-0.7303
Median Family Income 1989 ($thousands)	0.0028	0.0055	0.0075	-0.0094
Change in Median Family Income 1989-1999 ($thousands)	-0.0002	0.0003	0.0026	0.0023
Households per Square Mile (thousands), 1990	-0.0313	-0.0282	-0.0232	0.0161
Change in Households per Square Mile (thousands), 1990-2000	-0.0013	0.0092	-0.3353	-0.4953
Median Home Value ($10 thousands), 1990	-0.0030	-0.0065	0.0035	0.0268
Change in Median Home Value ($10 thousands),1990-2000	0.0111	-0.0012	-0.0337	-0.0141
Owner-Occupancy Proportion, 1990	-0.8070	-0.8508	-1.0159	-2.2360
Change in Owner-Occupancy Proportion, 1990-2000	-0.7449	-1.3690	-0.4430	-2.4140
Proportion of Units 50+ Years Old, 1990	2.8498	2.1720	0.5086	-0.8999
Change in Proportion of Units 50+ Years Old, 1990-2000	0.8932	0.7936	1.8007	1.5740
Proportion of Units Less than 5 Years Old, 1990	1.7828	1.1870	0.8470	2.1340
Change in Proportion of Units Less than 5 years Old	1.2714	1.6210	0.5189	2.4350
1997-1999 Foreclosures Per Single Family Building	4.9436	2.7970	4.2835	4.7130

Figure 1. Foreclosure Rate by Subprime Lender Share of Home Purchase Loans 81 Large Metros



Source: RealtyTrac, Inc. (2006); HMDA data obtained from www.dataplace.org

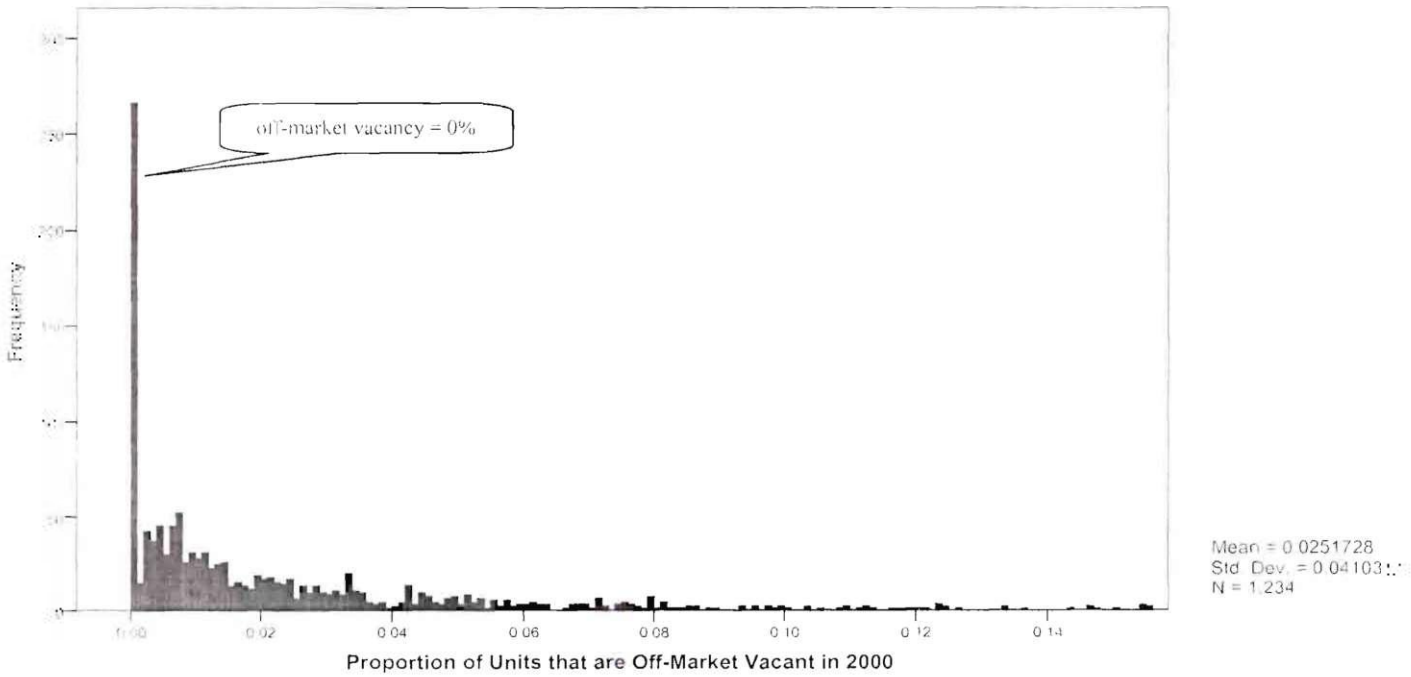
Figure 2. Number of Days from Foreclosure Notice to Sale



Source. RealtyTrac, Inc. (2006b)

Figure 3. Distribution of Cook County Census Tracts by Off-Market Vacancy Rate, 2000

Raw and Log Transform



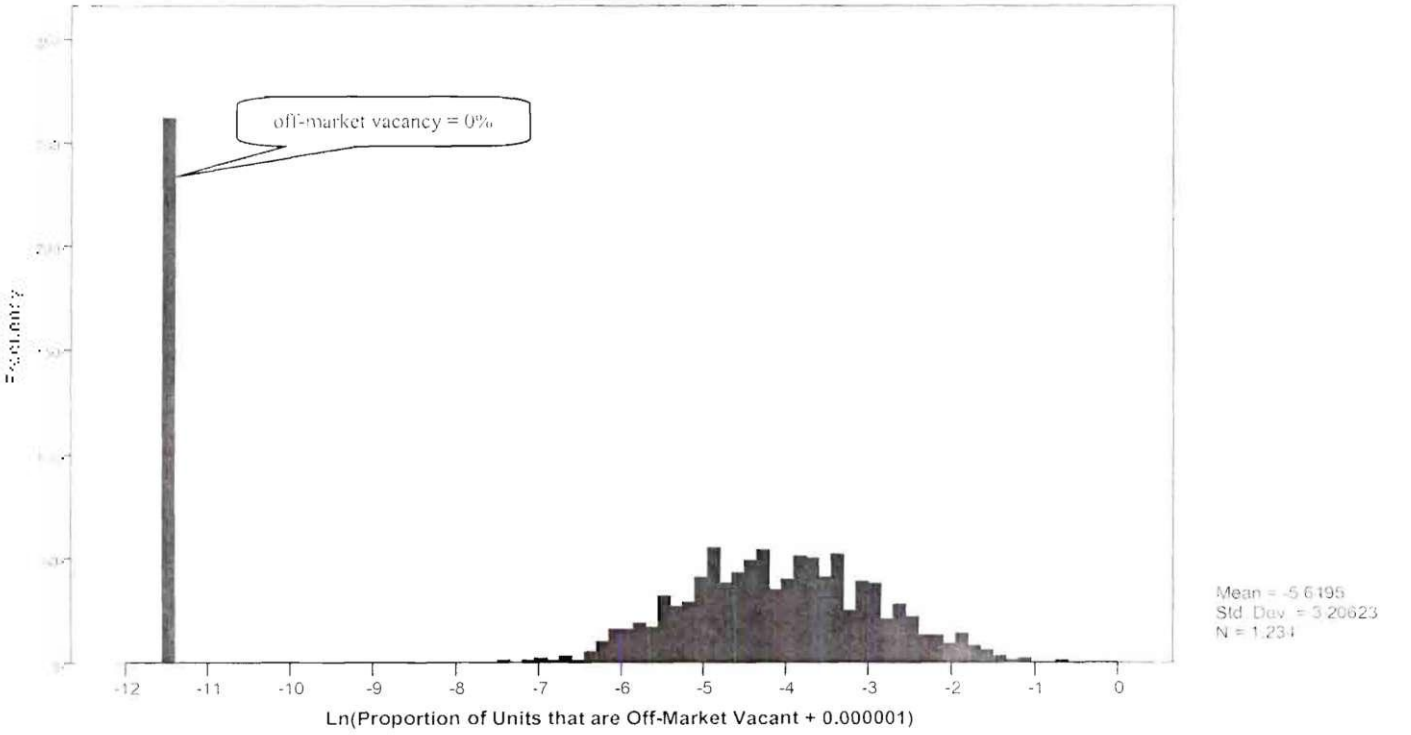


Figure 4. Distribution of Tracts by 2000 Off-Market Vacancy Rate, by 1997-1999 Foreclosure Rate
Cook County
(Tracts with Non-Zero Off-Market Vacancy Rates Only)